

CLAIMS

What is claimed is:

1. A protective device for a medical suction system said protective device comprising a housing having an inlet and an outlet, an actuator mechanism contained within the housing, said actuator mechanism having opposed blocking surfaces generally aligned with said inlet and said outlet, said actuator mechanism being movable between a contracted position wherein said blocking surfaces are displaced away from said inlet and said outlet and an expanded position wherein said blocking surfaces block both said inlet and said outlet, said actuator mechanism being biased toward said expanded position and a latch mechanism retaining said actuator mechanism in said contracted position, said latch mechanism adapted to sense the presence of a liquid within said housing to release said latch mechanism to move said actuator mechanism from said contracted position to said expanded position.
2. The protective device as defined in claim 1 wherein said latch mechanism includes a latch operable by a shape-metal alloy wire.
3. The protective device as defined in claim 1 wherein said latch mechanism comprises at least two movable latch members interfitted into a corresponding at least two fixed latch members, with said shape-metal alloy wire affixed between said at least two movable latch members, whereby said latch mechanism is released by the contraction of said shape-metal alloy wire.
4. The protective device as defined in claim 1 wherein said shape-metal alloy wire contracts inwardly by an electrical discharge to release the engagement of said at least two movable latch members from said at least two fixed latch members.

5. The protective device as defined in claim 2 wherein said protective device includes a battery powered electrical circuit to activate said shape-metal alloy wire upon the sensing of a liquid within said housing.

6. The protective device as defined in claim 1 wherein said housing is comprised of a transparent material and said actuator mechanism includes a visual indicator that is visible through said transparent housing to alert persons that said actuator mechanism is in said expanded position.

7. The protective device as defined in claim 6 wherein said visual indicator is a brightly colored diaphragm that is contracted when said actuator mechanism is in said contracted position and expands as said actuator mechanism moves to said expanded position.

8. The protective device as defined in claim 1 wherein said latch mechanism includes a pair of sensing electrodes adapted to sense the presence of a liquid therebetween to release said latch mechanism.

9. The protective device as defined in claim 8 wherein said sensing electrodes are located on opposite external surfaces of said actuator mechanism.

10. A medical vacuum system for withdrawing liquids from a cavity of a patient, said system comprising:

a source of vacuum, a patient circuit for communicating the source of vacuum to a cavity of a patient, said patient circuit including a vacuum regulator,

a protective device located in the patient circuit intermediate said vacuum regulator and a patient, said protective device comprising a housing having an inlet and an outlet, an actuator mechanism contained within the housing, said actuator mechanism having opposed blocking surfaces generally aligned with said inlet and said outlet, said actuating mechanism being movable between a contracted position wherein said blocking surfaces are displaced away from said inlet and said outlet and an expanded position wherein said blocking surfaces block both said inlet and said outlet, said actuating

mechanism being biased toward said expanded position and having a latch mechanism retaining said actuating mechanism in said contracted position, said latch mechanism adapted to sense the presence of a liquid within said housing to release said latch mechanism to move said actuator mechanism from said contracted position to said expanded position to terminate communication between a patient and the source of vacuum.

11. The medical vacuum system as defined in claim 10 wherein said protective device is affixed to said vacuum regulator.

12. The medical vacuum system as defined in claim 10 wherein said latch mechanism includes a latch operable by a shape-metal alloy wire.

13. The medical vacuum system as defined in claim 12 wherein said latch mechanism comprises at least two movable latch members interfitted into a corresponding at least two fixed latch members, with said shape-metal alloy wire affixed between said at least two movable latch members, whereby said latch mechanism is released by the contraction of said shape-metal alloy wire.

14. The medical vacuum system as defined in claim 12 wherein said shape-metal alloy wire contracts inwardly by an electrical discharge to release the engagement of said at least two movable latch members from said at least two fixed latch members.

15. The medical vacuum system as defined in claim 10 wherein said protective device includes a battery powered electrical circuit to activate said shape-metal alloy wire upon the sensing of a liquid within said housing.

16. The medical vacuum system as defined in claim 10 wherein said housing is comprised of a transparent material and said actuator mechanism includes a visual indicator that is visible through said transparent housing to alert persons that said actuator mechanism is in said expanded position.

17. A method of providing protection against liquid passing through a medical vacuum system, said method comprising the steps of:

providing a vacuum regulator adapted to be connected a source of vacuum,

providing a protective device upstream of the vacuum regulator and in fluid communication therewith, the protective device having an inlet and an outlet wherein gas normally flows through said outlet to the vacuum regulator,

sensing the presence of a liquid in said housing; and

blocking the inlet and the outlet of said protective device upon the sensing of the presence of a liquid.

18. The method as defined in claim 17 wherein the step of providing a protective device comprises providing a protective device having an actuator mechanism having a expanded position blocking the inlet and the outlet and a contracted position wherein gas can flow between said inlet and said outlet.

19. The method as defined in claim 18 wherein the step of blocking the inlet and the outlet comprises expanding the actuator mechanism.

20. A method as defined in claim 19 wherein the step of expanding the actuator mechanism comprises providing an actuator mechanism having an upper and a lower member, each having blocking surfaces to block said inlet and said outlet, biasing said blocking surfaces toward the expanded position of said actuator mechanism and providing a latching mechanism to retain said upper and lower members in the contracted position of said actuator mechanism and said step of blocking the inlet and outlet comprises releasing the latching mechanism upon the sensing of a liquid in said housing.

21. A method as defined in claim 20 said step of providing a latching mechanism comprises providing a shape-metal alloy wire adapted to contract upon receiving an electrical discharge, and said step of releasing the latching mechanism comprises applying an electrical discharge to the shape-metal alloy wire to contract the shape-metal alloy wire.

22. A method as defined in claim 21 wherein said step of applying an electrical discharge to the shape-metal alloy wire comprises providing a battery powered electric circuit to create an electrical discharge to the shape-metal alloy wire upon the sensing of a liquid within the housing.

23. A method as defined in claim 17 wherein the method further comprises the step of providing a visible indication when said step of blocking the inlet and outlet has occurred.